<<钢结构稳定>>

图书基本信息

书名：<<钢结构稳定>>

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作者：陈骥//陈浩军

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前言

The theory of structural stability is, strictly speaking, a branch of structural mechanics. But,from the process of the development, it can be observed that this learning is closely linked with theprogress of structural engineering. S. P. Timoshenko, in his classic monograph Theory of ElasticStability published in 1936, wrote: "The modern use of steel and high-strength alloys inengineering structures, especially in bridges, ships and aircraft, has made elastic instability aproblem of great importance". This statement made more than 60 years ago is still holding truenowadays, whereas buildings and offshore platforms are added to the rank of above structures andplasticity is more involved in stability issues. Constructional steel by itself is an elasto-plasticmaterial welding, the contemporary art of connection, gives rise to residual stresses whichaccentuate the inelastic behavior of steel members.

内容概要

本书为普通高等教育“十一五”规划教材，全书共八章，主要内容包括以下几个方面：（1）失稳分类：分岔失稳的类型，极值点失稳和跃越失稳。

（2）轴心受压柱，梁柱，刚接和半刚接刚架的平面弯曲屈曲性能和实用设计方法。

（3）柱，梁和梁柱的平面外弯扭屈曲性能和实用设计方法。

（4）薄板的凸曲和屈曲后性能，冷弯薄壁板件的局部屈曲，畸变屈曲，整体屈曲和它们之间的相关屈曲，有效宽度和直接强度两种设计方法。

（5）弹性和弹塑性钢结构的能量法和数值法以及其试验验证。

全书内容注重钢结构材料和构件几何非线性的特点，使之符合实际的结构设计。
同时，书中还附有依照国内外钢结构设计规范设计的许多钢结构构件和刚架有关理论研究和设计方法的实例。

本书可作为普通高等院校工程结构、工程力学专业研究生的教材，也可作为结构工程师和研究人员的参考用书。

书籍目录

章节摘录

edge-stiffened plate, as shown in Fig. A6. 8, into mang longitudinal strips. Each strip is assumedto be free to deform both in its plane to produce membrane displacements and out of its plane toproduce flexural displacements in a single half-sine wave over the length of the section beinganalyzed. The ends of the section are free to deform longitudinally but are prevented from deformingin a cross-sectional plane. This allows the section to be subjected to a range of longitudinal stressdistributions varying from uniform compression to pure bending. References [28], [29], [30]and [31] present the stability analysis of cold-formed members by finite strip method. A computerprogram THIN-WALL has been developed at University of Sydney to perform a finite strip analysisof thin-walled sections under compression and bending. These strips buckle cubic polynomialtransversely. The bending modes computed are for a single buckle half-wavelength. Each strip in the cross-section is assumed to be subjected to a longitudinal compressive stress o~ which isuniform along the length of the strip but varies linearly from one nodal line to the other line, asshown in Fig. A6. 8. A computer CUFSM has been developed at Cornell University for finite stripbuckling analysis. The above Figs. A6. 2 and A6. 3 show the relationships of plate element elastic local buckling,section distortional buckling and overall member flexural or flexural-torsional buckling undercompression and bending by using finite strip method respectively. For the short or medium lengthmember, if its length is shorter than the buckling half-wave length, as shown in Fig. A6. 2 or A6. 3,the flexural or flexural-distortional buckling stress will be higher than local or distortional bucklingstress. If the local buckling or distortional buckling occurs before, the member buckling load will bereduced. The influence of the distortiona

buckling on member buckling is much evident.